



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

A

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,757	03/05/2002	Rikuro Obara	2523-073	7424
7590	03/07/2006		EXAMINER	
ISRAEL GOPSTEIN P.O. Box 9303 Silver Spring, MD 20916-9303				PRESTON, ERIK D
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 03/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/087,757	OBARA, RIKURO
	Examiner Erik D. Preston	Art Unit 2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 01 December 2003.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-20 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_

5) Notice of Informal Patent Application (PTO-152)

6) Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1,6 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura et al. (US 5880545 previously cited) in view of Yoshikawa et al. (JP 06-173956).

With respect to claim 1, Takemura teaches a motor having a rotational member rotatably supported through a bearing device provided on a base member of the motor (as seen in Fig. 10), said bearing device including an inner ring (the race closest to Fig. 10, #79) and an outer ring (the race furthest from Fig. 10, #79) and a plurality of balls interposed therebetween (as seen in Fig. 10), said bearing device further including: A low expansion member (Fig., 10, #91) fit (the limitation of the member being press fit is a method limitation that is given little patentable weight in a product claim) around an outer periphery of the outer ring, wherein the low expansion member is made of resin (Col. 8, Lines 20-22), but it does not explicitly teach that the low expansion member has a lower coefficient of linear expansion than the outer ring. However, Yoshikawa teaches a bearing (Fig. 1, #1) with steel races (Fig. 1, #3 & 9) and ceramic balls (Fig. 1, #7). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the bearing system of Takemura in view of the steel races and ceramic balls as taught by Yoshikawa because the bearing of Yoshikawa provides a means for suppressing seizure due to the abrasion of rolling elements and a cage

(Yoshikawa, Abstract), and also because it would have been obvious to construct the bearing of Takemura in view of steel races and ceramic balls since it has been held that one of ordinary skill in the art at the time the invention would choose a suitable and desirable material, because it would be within the general skill of a worker in the art to select a material on the basis of its suitability for the intended use as a matter of obvious design choice (In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)). The combination of Takemura and Yoshikawa provides a steel outer race which has a higher coefficient of linear expansion than the resin low expansion member.

With respect to claim 6, Takemura in view of Yoshikawa teaches the bearing device of claim 1, and Yoshikawa teaches that the balls are made of ceramic material.

With respect to claim 16, Takemura in view of Yoshikawa teaches the bearing device of claim 1, and Takemura teaches that said low expansion member fit around the outer periphery of the outer ring is arranged for maintaining a radial clearance of said bearing device at a predetermined value (Col. 8, Lines 19-27) under a varying temperature condition (which inherently exists).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura et al. (US 5880545 previously cited) in view of Yoshikawa et al. (JP 06-173956) further in view of Sumi (US 6671125). Takemura in view of Yoshikawa teaches the bearing device of claim 1, but it does not specifically teach that the low expansion member is of a ceramic material. However, Sumi teaches a ceramic (Col. 6, Lines 15-17) low expansion member (Fig. 1, #30) fit on an outer periphery of an outer ring (Fig. 1, #21). It would have been obvious to one of ordinary skill in the art at the time of the invention

to modify the resin low expansion member of Takemura in view of the ceramic material as taught by Sumi as merely a substitution of well-known and equivalent materials for making bearing seals. It also would have been obvious to make the low expansion member of Takemura from ceramic material since it has been held that one of ordinary skill in the art at the time the invention would choose a suitable and desirable material, because it would be within the general skill of a worker in the art to select a material on the basis of its suitability for the intended use as a matter of obvious design choice (In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)).

Claims 2-5,8,10,12,14 & 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura et al. (US 5880545 previously cited) in view of Obara (US 6102575 previously cited) in view of Yoshikawa et al. (JP 06-173956).

With respect to claims 2-5, Takemura teaches a motor having a rotational member rotatably supported through a bearing device provided on a base member thereof, said bearing device including: A shaft (as seen in Fig. 10) to which an inner ring (the race closest to Fig. 10, #79) is fit slideably there around, a cylindrical outer ring member (the race furthest from Fig. 10, #79) surrounding the shaft, a plurality of balls of a first row (in the first bearing: Fig. 10, #79) interposed between a first inner ring raceway formed on an outer periphery of the inner ring and a first outer ring raceway formed on an inner periphery of the outer ring member (as seen in Fig. 10), a plurality of balls of a second row (in the second bearing: Fig. 10, #80) interposed between a second inner ring raceway formed on an outer periphery of a second inner ring and a second outer ring raceway formed on an inner periphery of the second outer ring

member (as seen in Fig. 10), and a low expansion resin (Col. 8, Lines 20-22) member/ring (Fig. 10, #91) fit (the limitation of the member/ring being press fit is a method limitation that is given little patentable weight in a product claim) around an outer periphery of the outer ring members, the inner ring is secured on the shaft with applying an appropriate amount of preload thereon (which is inherent), and wherein the shaft is secured on a base member to extend therefrom (as seen in Fig. 10), and a central portion of the rotational member (Fig. 10, #77) is fit over the outer periphery of the outer ring member, but it does not teach the second inner ring raceway formed directly on an outer periphery of the shaft, the first and second outer ring raceways being formed on the (singular) outer ring member, or that the low expansion member/ring has a coefficient of linear expansion that is lower than the coefficient of linear expansion of the outer ring. However, Obara teaches a second inner ring raceway (Fig. 7, #5) formed directly on an outer periphery of a shaft (Fig. 7, #1) and first and second outer ring raceways being formed on a (singular) outer ring member (Fig. 7, #2); and Yoshikawa teaches a bearing (Fig. 1, #1) with steel races (Fig. 1, #3 & 9) and ceramic balls (Fig. 1, #7). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the bearing system of Takemura in view of the compound bearing system as taught by Obara because a compound bearing system is easier to assemble than the conventional bearing arrangement (i.e. two separate bearings) of Takemura, and as merely a substitution of equally well-known bearing arrangements. It also would have been obvious to one of ordinary skill in the art at the time of the invention to modify the bearing system of Takemura in view of the steel

Art Unit: 2834

races and ceramic balls as taught by Yoshikawa because the bearing of Yoshikawa provides a means for suppressing seizure due to the abrasion of rolling elements and a cage, and also because it would have been obvious to construct the bearing of Takemura in view of steel races and ceramic balls since it has been held that one of ordinary skill in the art at the time the invention would choose a suitable and desirable material, because it would be within the general skill of a worker in the art to select a material on the basis of its suitability for the intended use as a matter of obvious design choice (In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)). The combination of Takemura and Yoshikawa provides a steel outer race, which has a higher coefficient of linear expansion than the resin low expansion member/ring.

With respect to claims 8,10,12 & 14, Takemura in view of Obara in view of Yoshikawa teaches the bearing device of claims 2-5, and Yoshikawa teaches that the balls are made of ceramic material.

With respect to claims 17-20, Takemura in view of Obara in view of Yoshikawa teaches the bearing device of claims 2-5, and Takemura teaches that said low expansion member/ring fit around the outer periphery of the outer ring is arranged for maintaining a radial clearance of said bearing device at a predetermined value (Col. 8, Lines 19-27) under a varying temperature condition (which inherently exists).

Claims 9,11,13 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura et al. (US 5880545 previously cited) in view of Obara (US 6102575 previously cited) in view of Yoshikawa et al. (JP 06-173956) further in view of Sumi (US 6671125). Takemura in view of Yoshikawa teaches the bearing device of claims 2-5,

but it does not specifically teach that the low expansion member/ring is of a ceramic material. However, Sumi teaches a ceramic (Col. 6, Lines 15-17) low expansion member/ring (Fig. 1, #30) fit on an outer periphery of an outer ring (Fig. 1, #21). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the resin low expansion member/ring of Takemura in view of the ceramic material as taught by Sumi as merely a substitution of well-known and equivalent materials for making bearing seals. It also would have been obvious to make the low expansion member of Takemura from ceramic material since it has been held that one of ordinary skill in the art at the time the invention would choose a suitable and desirable material, because it would be within the general skill of a worker in the art to select a material on the basis of its suitability for the intended use as a matter of obvious design choice (In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960)).

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed 12/01/2003, with respect to the rejection(s) of claim(s) 1-15 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 3986754 & US 6809898

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik D. Preston whose telephone number is (571)272-8393. The examiner can normally be reached on Monday through Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
02/23/2006

